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Chen Xie* (chen.xie@uwaterloo.ca). *On the Incidence Coloring Conjecture for Cartesian Graph Products.*

An *incidence* in a graph G is a pair (v, e) such that $v \in V(G)$, $e \in E(G)$, and $v \in e$. An *incidence coloring* of G is a coloring of its incidences such that adjacent incidences receive different colors. The Incidence Coloring Conjecture claims that for all graphs G , its *incidence chromatic number*, denoted $\chi_i(G)$, is bounded above by $\Delta(G) + 2$. Gregor and Luzar conjectured in 2015 that for all graphs G, H such that $\chi_i(G) = \Delta(G) + 1$, and $\chi_i(H) \leq \Delta(H) + 2$, their Cartesian product $G \square H$ satisfies the Incidence Coloring Conjecture. We prove that the conjecture is false, provide a characterization of Cartesian products of graphs that satisfies the Incidence Coloring Conjecture, and find the explicit values of incidence chromatic numbers of the Cartesian products of complete graphs and paths, and of stars and paths. (Received September 21, 2015)